# بسم الله الرحمن الرحيم

عنوان المحاضرة: **Renal Trauma**
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**-Types of Trauma:**

**1-Blunt: e.g. Fall from Height, Animal Kick, Motor Car Accident**
**2-Penetrating: e.g. Firearm injury, Stab wound**
**3-Iatrogenic: e.g. Percutaneous Nephrolithotripsy** (ازالة الحصوات بالمنظار)

**-Liability of Kidney to Trauma (Protective Mechanisms)**

**1-Being Retro peritoneum 2-Muscles (3 Layers: Ext. Oblique, Int. Oblique, Latissimus Dorsi)**
**3-Mobility with Respiration 4-Perirenal Fat 5-Ribs**

**-Incidence: Common (esp. motor car accident & penetrating)**

**-Classification of Renal Trauma: (According to ASST; American Association for the Surgery of Trauma)**

- **Grade I ► Contusion or non-enlarging subcapsular Hematoma, but no laceration**
- **Grade II ► Superficial laceration < 1cm depth and does not involve the collecting system; non expanding perirenal hematoma**
- **Grade III ► Laceration > 1cm, without extension into the renal pelvis or collecting system and with no evidence of urine extravasation**
- **Grade IV ► Laceration extends to renal pelvis or urinary extravasation.**
- **Grade V ► Shattered kidney; Devascularisation of kidney due to Hilar injury.**

**-How to Diagnose:**

**A) History: -History of Trauma (e.g. Car accident, stab, ….)**

**B) Examination:**

**I) General: Vital Data (shock, tachycardia, Hypotensive, …..)**

**II) Local (Abdominal):**

- **Blunt →Ecchymosis -Stab→Site of entry -Firearm→Inlet or Exit**
- **Tenderness and Rigidity (Surgical Abdomen)**
- **Hematuria: Gross or Microscopic**

**-عدم وجود Hematuria لا يعني عدم وجود Renal Injury لأن ممكن في Grade IV,V ملاقيش Hematuria زي لو فيه إصابة على مستوى الـ UPJ أو لو فيه Vascular Injury زي الـRenal Artery Thrombosis أو Segmental Renal Vein**

**C) Investigations**

**1-Ultrasound:**

**Adv.: Easy, Available, No Radiation, detect ectopic kidney, detect subcapsular hematoma, Follow-Up**
**Disadv.: Operator dependent** (تقييم الحالة بيختلف من شخص للآخر)

**2-IVP (Intravenous pyelogram): *for Stable Patient with isolated renal injury**
**Two Types: -Standard -Emergency (One Shot)**
**Detect: Vascular Injury, Extravasation, Calyceal distortion**

**3-CT: More accurate 4-MRI 5-Renal Angiography 6-Nuclear Study / Radioisotope**

**-Treatment:**

**A) Conservative (Grade I, II, III but patient must be hemodynamically STABLE)**
**-Serial Follow-Up Sonar -Hemoglobin -Vital data**

**B) Operative:**

**Indications:**

**I-Absolute indications for exploration:**

1-Hemodynamically Unstable 2-Hematoma (expanding/pulsatile)

3-Suspect of vascular Involvement (Renal pedicle) that can't be confirmed by available Investigations

4-UPJ disruption

**II-Relative:**

1-Urinary extravasation 2-Segmental Vascular injury

**Exploration Approach:** Trans-abdominal Incision (Aiming at Controlling the renal pedicle)

***Normal approach in case of renal stones is (last rib incision)

**Principles of reconstruction**

1-Debridement (Removal) of non-viable tissue 2-Good exposure and hemostasis

3-Watertight closure of Pelvicalyceal system 4-Use Omentum to support the repair

5-Place drains before closing the operations

**Operations:**

**1-Renorrhaphy:** Repair of the Pelvi-Calyceal System

**2-Partial Nephrectomy:** if only part of the Kidney is affected

**3-Total Nephrectomy:** Shattered kidney or Vascular Injuries (i.e. Injury beyond repair)

**Complications of Renal Trauma:**

**A) Of Conservative ttt:**

1- Collection of tissue →Abscess 2-Extravasation → Fistula 3-Chronic Pyelonephritis

4- Atrophic Kidney esp. in Vascular Injuries 5-Hypertension

**B) Of Operative ttt:**

All Complications of Surgery e.g. Secondary Bleeding

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